

An Automatic Attendance Management System Using Image Processing

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Abstract:

Through the use of computer vision techniques, then Automated Attendance System utilizing Image Processing project seeks to streamline then current attendance-taking procedure. The system takes a picture and uses image processing algorithms to automatically register people's attendance in a variety of venues, including meetings, events, and classes. By using facial recognition technology, the systems records attendance without requiring manual entry, which lowers the possibility of human error. The system makes sure that attendance is managed accurately and efficiency by using sophisticated image processing algorithms. This increases the overall productivity and dependability of the attendance tracking process. This project improves time management and overall administrative work efficiency in a variety of ways by automating monitoring system.

Keywords: Image Processor Algorithms, python, CNN

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I. Introduction:

The advent of the Automatic Attendance Management System employing Image Processing, the traditional practice of manual attendance management is experiencing a revolutionary metamorphosis in an era defined by unparalleled technical advancements. This ground-breaking method marks a sea change in how businesses, organizations, and educational institutions monitor attendance. The technology provides a smooth and precise way to identify and record people in real time by utilizing the capabilities of state-of-the-art image processing and face recognition technologies. The main issue this system attempts to solve is the vulnerabilities and inefficiency of conventional techniques for keeping track of attendance. The Automatic Attendance Management System, with facial recognition at its core, assures accuracy and does away with labor intensive manual operations. It gathers attendance data instantly while operating in real-time, giving administrators access to accurate and timely data. In addition to its technological capabilities, the system's intuitive user interface highlights its dedication to accessibility by streamlining participant enrolment and administrative management. This system emerges as a lighthouse, indicating the confluence of efficiency and technology in the organizational environment as we stand on the precipice of a new era in attendance management.

Objectives Of The Project Work:

The objective of this project is to develop image processing based automated student attendance system. Expected achievements in order to fulfill the following objectives:

- ✓ To identify the video frame's face component
- ✓ To extract the useful features from the face detected.
- ✓ To classify the features in order to recognize the face detected.
- ✓ To record the attendance of the identified student.
- ✓ To identify face with different face variations/poses

II. Literature Review:

We studied Some Paper in that we know that about making attendance system and some of papers are Title[1]: Attendance Monitoring System Using Image Processing”, The study introduces a system for automating attendance marking in schools and colleges, reducing human intervention through a four-phase process: creating a face database, detecting, recognizing, and marking attendance. The Viola-Jones algorithm is a popular face detection method due to its high detection rate and efficiency, especially useful for real-time applications. It uses a 24 X 24 window for cropping and image processing, Title[2] : Attendance Monitoring System Using Image Processing The paper introduces an Automatic Attendance System in a classroom, utilizing image processing techniques, face detection, HOG and LBP algorithms, and a Support Vector Machine classifier for immediate The system uses pre-processed images, face features extraction, and SVM classifier to identify attendance, with Ada

boost technique for enhanced efficiency and accuracy Title[3]: A Review Paper on Attendance Management System Using Face Recognition Attendance Management Systems utilize face recognition software to identify individuals in organizations or colleges, reducing human intervention by capturing images and recognizing faces, then entering them into a database. he proposed system enhances attendance management by utilizing biometric facial recognition algorithms for confirmation and documentation, utilizing Haar Cascade technique for quick face identification, Title[4] : An improved face recognition algorithm and its application in attendance management system. The research paper introduces a new face recognition method using the Local Binary Pattern algorithm and advanced image processing techniques, demonstrating its accuracy, reliability, and robustness for real-life applications. The LBP face recognition algorithm uses image quality properties to enhance its accuracy. It uses a local binary pattern, comparing central blocks with surrounding blocks, and updates attendance if matched, Title[5]: Multiple Face Recognition using MATLAB for Attendance Management The project proposes an automatic attendance system for teaching institutions, utilizing Viola Jones and local binary pattern algorithms for secure, effective student attendance monitoring. The LBP face recognition algorithm uses image quality properties to enhance its accuracy. It uses a local binary pattern, comparing central blocks with surrounding blocks, and updates attendance if matched.

III. Proposed Methodology:

The proposed system overcomes the limitations of the existing system that are used for the face recognition. In this proposed system we are using open cv and DNN modules. OpenCV and the DNN module are vital in automatic attendance systems, offering image processing tools for facial detection, recognition, and real-time analysis. OpenCV's versatility and cost-effectiveness, coupled with DNN's deep learning integration, enhance accuracy, making them essential for efficient and reliable attendance management through image processing. PIR sensor is connected the camera. When the person comes near the sensor then the camera which is connected to the sensor will automatically start recording and the face of the person detected and recognized and attendance is marked automatically.

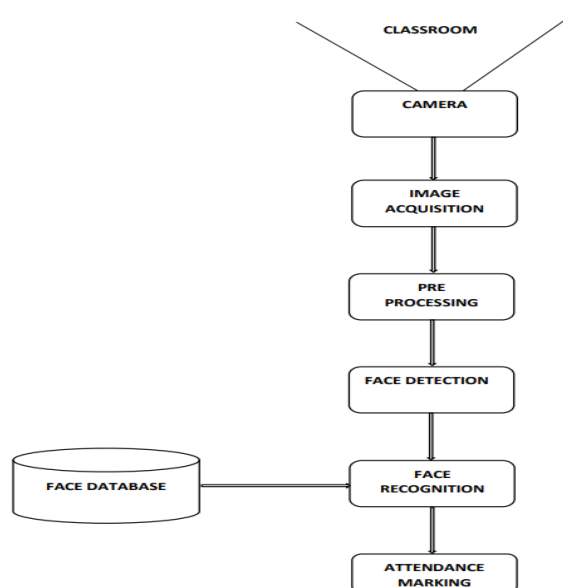


Fig1. Proposed system architecture

Expected Outcome:

In this system, we are using PIR (Passive Infrared) sensor and that is connected to the camera. Whenever a person comes near the sensor, then the PIR sensor is used to sense and then camera will turn on. With the help of camera, the face of the person is captured and that image is processed and detected. That detected image is compared with the database and face is recognized and attendance of the person is marked.

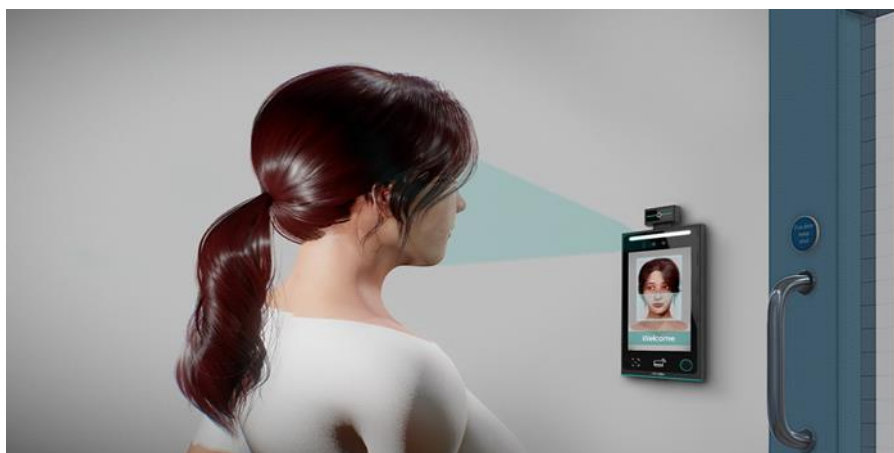


Fig2: Sample of the model

G11							
	A	B	C	D	E	F	G
1	Attendance						
2	Names	Total	Wed 2/1/17	Thu 2/2/17	Fri 2/3/17	Mon 2/6/17	Tue 2/7/17
3	Student1	3	1	1	1		
4	Student2	3	1	1	1		
5	Student3	3	1	1	1		
6	Student4	3	1	1	1		
7	Student5	2	1	1			
8	Student6	2	1	1			
9	Student7	3	1	1	1		
10	Student8	2		1	1		
11	Student9	2		1	1		
12	Student10	3	1	1	1		
13	Student11	2	1	1			
14	Student12	2	1	1			
15	Student13	3	1	1	1		
16		0					
17		0					

SL.NO	TITLE	METHODOLOGY	ACCURACY
1.	Online Classroom Attendance Marking System Using Face Recognition, Python, Computer Vision, and Digital Image Processing	Viola-Janes algorithm	93%
2.	An Automatic Student Attendance Monitoring System Using an Integrated HAAR Cascade with CNN for Face Recognition with Mask	HAAR Cascade with CNN	95%
3.	Implementation of Attendance System using Face Recognition and PCA	Face Recognition and PCA	94%
4.	Attendance Monitoring System Using Image Processing	HAAR Cascade	95%
5.	An effective automatic live attendance management system (Proposed)	OpenCV and DNN modules	97%

Table 1. Methodologies and accuracy of existing and

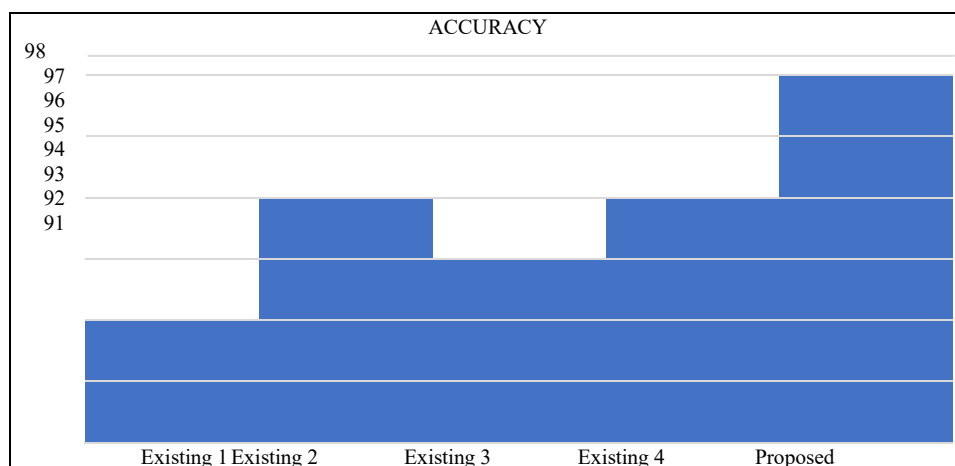


Fig . Accuracy of Existing and proposed methodology

IV. Conclusion:

Face recognition software is usually associated with highly secure, very costly applications. Modern basic technologies have progressed and as a result of more integration and computing capacity, equipment costs are falling dramatically. Facial recognition software is now available for use in many very precise, trustworthy, and reasonably priced applications. As such, there are no technological or financial barriers to the wider adoption of the pilot project. In this project, the proposed work developed a face recognition system using OpenCV, DNN modules, and principal component analysis techniques by creating our own database/dataset.

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